Instructor Resources

'The Great Debate': The Complex oexistence of Science and Religion

Project | Module 2: Science and Identity

Created by:

Description

We know at times there is a perceived clash between science and religion by teachers and students that can impact learning. Often this comes to light when teaching topics such as evolution, which is a fundamental topic to biology. In this lesson students will learn about the affordances and limitations of science and develop their cultural competency through collaboration, discussion, and a variety of class activities to understand that science and belief in religion can coexist.

Scientific Processing Skills:	N/A
Pedagogical Approaches:	Think-pair-share Collaborative Work Pre/Post Questions
Bloom's Cognitive Levels:	Application & Analysis
Principles of how people learn:	Leverage differences among learners Focuses student on the material to be learned
Vision and Change Competencies:	Ability to understand the relationship between science and society
Core Biological Concepts Covered:	Evolution

Learning Goals

Students should be able to define and comprehend cultural competence
Students should acknowledge the limitations of science.
Students should be able to generate effective critical thinking of the given topic.

Learning Objectives

Compare and contrast between ideas of religion and science

Suggested Courses

Evolution
Introductory Biology

Additional Resources

Barnes, M. E., & Brownell, S. E. (2018). A call to use cultural competence when teaching evolution to religious college students: Introducing religious cultural competence in evolution education (ReCCEE). *CBE—Life Sciences Education*, *16*(4). https://doi.org/10.1187/cbe.17-04-0062

Bertka, C. M., Pobiner, B., Beardsley, P., & Watson, W. A. (2019). Acknowledging students' concerns about evolution: A proactive teaching strategy. Evolution: Education and Outreach, 12(1). https://doi.org/10.1186/s12052-019-0095-0

Truong, J. M., Barnes, M. E., & Brownell, S. E. (2018). Can Six minutes of culturally competent evolution education reduce students' level of perceived conflict between evolution and religion? The American Biology Teacher, 80(2), 106–115. https://doi.org/10.1525/abt.2018.80.2.106

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Implementation Guide

Activity	Description	Time	Notes
Introduction	Introduce concept of cultural competence. Introduce evolution.	15 min	Instructor shows slide encouraging students to have empathy, be understanding and aware, and show respect to the diverse opinions in the classroom.
Think, Pair, Share Activity	Ask students, “is evolution controversial?”	10 min	Students will discuss if evolution is controversial in small groups, and will have the opportunity share responses with the class.
Introduce historical controversy in science	Instructor shows slides describing the origin of the theory of heliocentrism and the conflict that arose from religious figureheads.	3 min	Purpose: Showing historical controversy of a theory that is now universally accepted
Lens Activity	Class discussion facilitated by slides	8 min	Lens Activity details described on following pages.
Group Activity	Students will break out into small groups.	15 min	Students determine what can and cannot be properly evaluated using the scientific method.
Class discussion on the limitations of science	Instructor shows slides on how science and religion can coexist. These should include quotes from religious figureheads and evolutionary biologists on the ability of science and religion to coexist.	10 min	Note: It is important for students to be able to make the connection that because science cannot be used for understanding the supernatural, religion and science can coexist.

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Adaptations

In a larger classroom, this could be an iClicker question rather than a card-sorting activity.

Implementation Guide

Limitations of science activity:

Students sort cards below into "yes" or "no" piles to answer the question "Can this phenomenon be explained using scientific inquiry?":

- Sudden drop in temperature indicates the presence of a ghost
- Green plants grow towards a light source
- Sponges filter bacteria out of the water on coral reefs
- Pele, the goddess of fire, inflicts a curse on those who remove lava rock from the Hawaiian Islands.
- Crop circles are caused by extraterrestrial life forms

(Cards are from Angela's intro bio slides)

Ask students afterwards:
How did you decide whether the claim could be investigated through science?
If a claim cannot be investigated through the practices of science, does that mean that the claim is false?

Explain that there are many approaches to explaining phenomena (scientific, historical, political, religious, economic, philosophical, etc.). In this science class, we will be exploring and constructing scientific explanations which are supported by scientific evidence and scientific reasoning. Science gathers observations to understand the natural world, and therefore cannot make inferences regarding the supernatural. Likewise, supernatural explanations should not be used to explain natural phenomena (since they cannot be tested scientifically).

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Adaptations

Implementation Guide

Photo Activity:

Show the photo below. Ask students: “What color is this person's shirt?” Then ask: “Are this person’s eyes open?” Students should identify that they cannot know.

Then show the second photo. Ask students “Are this person’s eyes open?”

Point out that an infrared lens was used for the second photo. Different lenses allow us to perform differential interpretation of the world around us. In science, we use a lens that gathers facts and uses evidence to make inferences about the natural world. Because of this, science is limited to observations that can be made within the boundaries of the natural world.

(Photo obtained from creative commons. Photographer: Andrew Steele)

Student Handout

'The Great Debate': The Complex oexistence of Science and Religion

Name: Date:

Notes:

1. How would you define "cultural competence"?

2. What is evolution?

3. Would you say that evolution is controversial? Why or why not?

4. Is heliocentrism controversial? Why or why not?

5. In your opinion, can evolution and religion co-exist? Why or why not?

Student Assessment

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Name: Date:

What color is this person's shirt? _____

Are their eyes open? _____

Are this person's eyes open? _____

How does this example relate to the Nature of Science and the relationship between religion and science?

For each scenario, answer whether the phenomenon be explained using scientific inquiry:

1. Sudden drop in temperature indicates the presence of a ghost

2. Green plants grow towards a light source

3. Sponges filter bacteria out of the water on coral reefs

4. Pele, the goddess of fire, inflicts a curse on those who remove lava rock from the Hawaiian Islands.

5. Crop circles are caused by extraterrestrial life forms

Student Assessment

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Name: Date:

After examining the nature and limitations of science, do you believe that evolution and religion can co-exist? Discuss in your groups and record your answer.

How are religion and evolution distinct, and how do they relate?